Trend Study 23-4-03

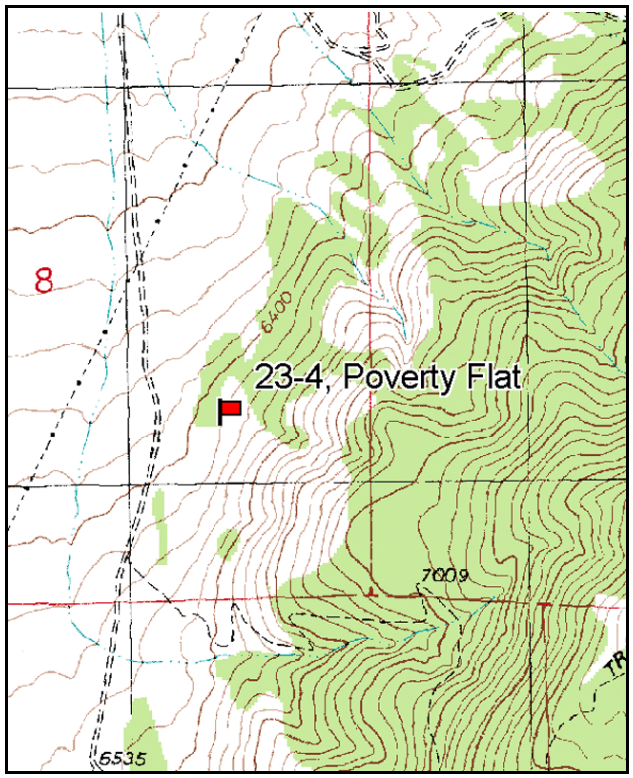
Study site name: Poverty Flat . Vegetation type: Wyoming Big Sagebrush .

Compass bearing: frequency baseline 162 degrees magnetic. (Line 3 & 4 175°M)

Frequency belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft). Rebar: belt 2 on 2ft, belt 5 on 1ft.

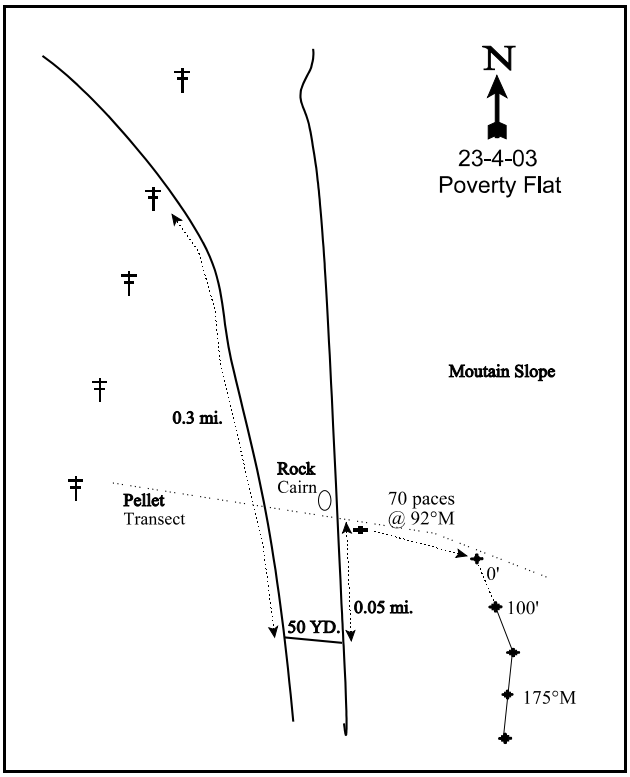
LOCATION DESCRIPTION

From 600 South and Main in Monroe, turn southwest on Jones Road, a gravel road coming in at a 45 degree angle. Proceed 3.4 miles to a junction, stay left. Go up this road 1.7 miles to a fork. Stay right, go 0.5 miles and pass under a powerline. Continue 0.3 miles further to a fork, turn left. Go about 50 yards then turn left again. Go another 0.05 miles (about 150 yards) to a witness post on the east side of the road. Walk up slope to the 5th yellow stake. The frequency baseline begins 12 feet south of the 5th yellow stake east of the road (about 365 feet from road).



Map Name: Monroe

Township 26S , Range 3W , Section 8



Diagrammatic Sketch

GPS: NAD 27, UTM 12S 4267143 N, 400228 E

DISCUSSION

Poverty Flat - Trend Study No. 23-4

This study is located on the west side of the Monroe Mountains on the foothills above Poverty Flat, south of the town of Monroe. The hillside study has a slope of about 20%-25%, an elevation of 6,420 feet, and a west aspect. The slope was originally covered by juniper and Wyoming big sagebrush. When the site was visited in 1998, it was determined that a wildfire had burned through the area in 1997, eliminating all the key browse species. The land is administered by the BLM and is part of a sheep allotment. Sheep use is more concentrated on the flat, and they graze the hillside where the transect is located only when trailing to and from summer pasture on the forest. Deer use on the site has been moderate to heavy in the past prior to the burn, as evidenced by the numerous pellet groups, hedging and antler drops. Several carcasses were found near the site in both 1985 and 1991, indicating winter losses. Wildlife use has been lighter since the burn and the elimination of most of the Wyoming big sagebrush. A pellet group transect read in conjunction with the vegetative transect in 1998 estimated 19 deer days use/acre (47 ddu/ha) and 2 elk days use/acre (5 edu/ha). Data from 2003 estimated 57 deer and 5 elk days use/acre (141 ddu/ha and 12 edu/ha). No livestock sign was noted in 1998 or 2003.

The effective rooting depth is moderately shallow at about 11 inches. Rocks are concentrated in the upper portion of the soil profile and on the surface. A year after the fire in 1998, ground cover was predominately large rocks and pavement, leaving very little bare soil. Soil temperature was relatively high averaging 81° F at just over 12 inches in depth. This high temperature will be very limiting to the establishment of perennial species after the wildfire and would allow continued dominance of the site by annuals. By 2003, much of the soil surface was covered with cheatgrass and rock leaving little bare ground exposed. Soil texture is a loam which is neutral in reactivity (pH 6.7).

This site in the past supported a stand of Utah juniper with a thick stand of Wyoming big sagebrush in the understory. The sagebrush had been browsed heavily in the past, and although it appeared healthy, its growth and seed production was below optimum. After the wildfire, there are few sagebrush plants within the sampled area. Density was estimated at only 40 plants/acre in 1998. Due to the lack of preferred browse forage this area would no longer be considered a winter range for deer. Density of sagebrush was estimated at 400 plants/acre in 2003. Approximately 65% of the population consists of mature plants, while 30% were classified as decadent. Recruitment is poor and limited by the dense cover of annual cheatgrass and high soil temperatures. Prostrate kochia was seeded after the burn, and although it is vigorous and producing good growth, it is not abundant. Most juniper trees were killed by the fire yet some scattered trees survived.

Perennial herbaceous vegetation was sparse in past readings, and with the wildfire and poor establishment of seeded species, cheatgrass and other weeds dominate the site. Cheatgrass was present in 1998, but not particularly abundant. However, it provided 86% of the total grass cover with a cover value of 9%. The only other grasses included some squirreltail and a few Sandberg bluegrass and Indian ricegrass plants. In 2003, cheatgrass still dominates the understory and has increased in nested frequency and has a cover value of 25%. Some seeded grasses, crested and intermediate wheatgrass, were sampled in 2003, although they occur in low numbers. Utilization of the perennial grass species was moderate in the past, but it was not apparent whether the use was from wildlife or livestock. Forbs are still rarely found on this site except for a few weeds.

1985 APPARENT TREND ASSESSMENT

The soil type is one of severe erosion potential, but is stabilized here by the extensive rock and pavement cover (53%). There is also no evidence of sedimentation. The vegetative community appears to have struck a balance between the sagebrush and junipers and other increasers. However, if the site is grazed excessively by trailing sheep in spring and fall, the desirable perennial grasses and sagebrush will decline.

1991 TREND ASSESSMENT

The soil trend is downward because bare soil has increased in cover from only 2% to 11%. Most of this increase has come from a loss of litter cover. This condition should be watched closely, for with more drought, this condition could worsen. Wyoming big sagebrush has increased it's density by 30% with only a slight increase in percent decadence. It should also be noted that the number of heavily hedged sagebrush (>60% use) has increased from 9% to 41%, while shrubs exhibiting poor vigor increased from 0% to 33%. Average plant height and crown have also decreased substantially. Even with the increase in it's density, the other measured parameters indicate the health of the community is declining with this prolonged drought. This condition could turn around with an end to the drought. The herbaceous understory is still almost nonexistent except for a few bottlebrush squirreltail.

TREND ASSESSMENT
soil - slightly downward (2)
browse - slightly downward (2)
herbaceous understory - downward and poor (1)

1998 TREND ASSESSMENT

Trend for soil is down. Although percent bare soil has changed little, the fire has changed many other important parameters on the site. The most noticeable is that protective herbaceous and litter cover have been severely altered. At the present time, 80% of the herbaceous cover comes from only two weedy species which became more dominant after the fire. Protective litter cover is now down to only 12%, while rock and pavement cover is up to 67%. The trend for browse is obviously down as 99% of the Wyoming big sagebrush was lost to the fire of 1997. The trend for the herbaceous understory is also down, because without the major two weedy species, total herbaceous cover would be just over 2%, one of the lowest values we have measured.

TREND ASSESSMENT
soil - down (1)
browse - down (1)
herbaceous understory - down (1)

2003 TREND ASSESSMENT

Trend for soil has improved slightly due to an increase in vegetation and litter cover. There is little bare ground exposed and the erosion condition class was determined to be stable in 2003. Trend for browse is improving. Wyoming big sagebrush is still lacking with only 400 plants/acre estimated. Recruitment is poor and obviously limited by the dense understory of annual cheatgrass. It will take time for the sagebrush to become reestablished. Trend for the herbaceous understory is mixed. Sum of nested frequency for perennial grasses has increased but frequency and cover of cheatgrass has also increased. It now accounts for 86% of the grass cover with a high cover value of 25%. Cheatgrass is tall and vigorous and more than abundant enough to carry another wildfire. Some seeded perennial grasses have become established but they occur in limited numbers. Forbs are rare and consist of annual and biennial weeds. With this in mind, trend for the herbaceous understory is considered down slightly. Due to the rocky nature of the site, further rehabilitation is not very feasible. This site needs to be protected from wildfire and hope that the few sagebrush and native perennial grasses on the site can reestablish themselves.

TREND ASSESSMENT
soil - up slightly (4)
browse - up slightly (4)
herbaceous understory - down slightly (2)

HERBACEOUS TRENDS --
Management unit 23 , Study no: 4

Type	Species	Nested Frequency				Average Cover %	
		'85	'91	'98	'03	'98	'03
G	Agropyron cristatum	$_{a}$-	$_{a}$-	$_{a}$-	$_{b}$58	-	2.25
G	Agropyron intermedium	-	-	-	4	-	.16
G	Bromus tectorum (a)	-	-	$_{a}$160	$_{b}$316	9.03	25.35
G	Oryzopsis hymenoides	4	-	1	4	.03	.22
G	Poa secunda	7	7	5	13	.18	.35
G	Sitanion hystrix	$_{b}$77	$_{ab}$48	$_{ab}$60	$_{a}$37	1.24	1.02
Total for Annual Grasses		0	0	160	316	9.03	25.35
Total for Perennial Grasses		88	55	66	116	1.44	4.00
Total for Grasses		88	55	226	432	10.48	29.35
F	Alyssum alyssoides (a)	-	-	-	1	-	.00
F	Argemone munita	-	-	2	-	.15	-
F	Astragalus spp.	1	-	-	-	-	-
F	Calochortus nuttallii	-	-	1	-	.00	-
F	Castilleja spp.	-	-	1	-	.00	-
F	Descurainia pinnata (a)	-	-	4	9	.04	.07
F	Erigeron pumilus	1	3	-	-	-	-
F	Euphorbia spp.	-	-	5	-	.04	-
F	Lappula occidentalis (a)	-	-	4	-	.01	-
F	Lactuca serriola	-	-	-	7	-	.04
F	Leucelene ericoides	$_{a}$-	$_{a}$-	$_{b}$15	$_{a}$-	.33	-
F	Lupinus argenteus	-	-	3	-	.15	-
F	Nicotiana attenuata (a)	-	-	3	-	1.06	-
F	Sisymbrium altissimum (a)	$_{a}$-	$_{a}$1	$_{a}$-	$_{b}$35	-	2.07
F	Unknown forb-perennial	-	-	-	-	.38	-
Total for Annual Forbs		0	1	11	45	1.11	2.15
Total for Perennial Forbs		2	3	27	7	1.07	0.03
Total for Forbs		2	4	38	52	2.18	2.19

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS --
Management unit 23 , Study no: 4

Type	Species	Strip Frequency		Average Cover %	
		'98	'03	'98	'03
B	Artemisia tridentata wyomingensis	2	13	-	2.31
B	Atriplex canescens	0	1	-	-
B	Gutierrezia sarothrae	10	12	.16	.22
B	Juniperus osteosperma	0	1	.63	.38
B	Kochia prostrata	0	2	-	.03
B	Sambucus cerulea	0	1	-	-
Total for Browse		12	30	0.79	2.95

CANOPY COVER, LINE INTERCEPT --
Management unit 23 , Study no: 4

Species	Percent Cover
	'03
Artemisia tridentata wyomingensis	1.48
Atriplex canescens	.53
Gutierrezia sarothrae	.85
Juniperus osteosperma	3.40
Kochia prostrata	.40

POINT-QUARTER TREE DATA --
Management unit 23 , Study no: 4

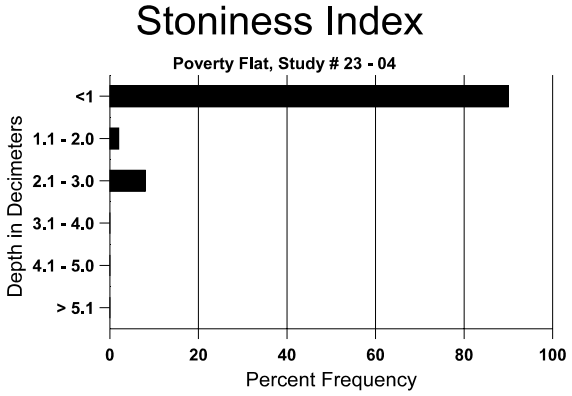
Species	Trees per Acre		Average diameter (in)	
	'98	'03	'98	'03
Juniperus osteosperma	26	N/A	9	N/A
Pinus edulis	20	N/A	1.6	N/A

BASIC COVER --
Management unit 23 , Study no: 4

Cover Type	Average Cover %			
	'85	'91	'98	'03
Vegetation	3.25	2.75	14.86	33.31
Rock	28.75	25.25	48.72	33.97
Pavement	24.00	28.00	18.13	1.89
Litter	41.50	33.25	11.90	35.83
Cryptogams	.25	0	.06	.15
Bare Ground	2.25	10.75	9.93	7.62

SOIL ANALYSIS DATA --
Management unit 23, Study no: 4, Study Name: Poverty Flat

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	ds/m
11.1	81.0 (12.6)	6.7	44.0	35.4	20.6	4.8	26.2	163.2	0.8



PELLET GROUP DATA --
Management unit 23 , Study no: 4

Type	Quadrat Frequency	
	'98	'03
Rabbit	-	8
Elk	1	1
Deer	3	21

Days use per acre (ha)	
'98	'03
-	-
2 (5)	5 (12)
19 (47)	57 (141)

BROWSE CHARACTERISTICS --
Management unit 23 , Study no: 4

		Age class distribution (plants per acre)					Utilization				
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% poor vigor	Average Height Crown (in)
Artemisia tridentata wyomingensis											
85	**5399**	533	1133	3200	1066	-	58	9	20	0	20/23
91	**7733**	733	1133	4000	2600	-	38	41	34	33	15/17
98	**40**	-	20	-	20	660	0	0	50	0	-/-
03	**400**	-	20	260	120	360	10	0	30	25	19/23
Atriplex canescens											
85	**0**	-	-	-	-	-	0	0	-	0	-/-
91	**0**	-	-	-	-	-	0	0	-	0	-/-
98	**0**	-	-	-	-	-	0	0	-	0	-/-
03	**20**	-	-	20	-	-	0	0	-	0	32/48
Echinocereus spp.											
85	**0**	-	-	-	-	-	0	0	-	0	-/-
91	**66**	-	-	66	-	-	0	0	-	0	5/6
98	**0**	-	-	-	-	-	0	0	-	0	-/-
03	**0**	-	-	-	-	-	0	0	-	0	4/7
Gutierrezia sarothrae											
85	**0**	-	-	-	-	-	0	0	0	0	-/-
91	**0**	-	-	-	-	-	0	0	0	0	-/-
98	**500**	20	180	320	-	40	0	0	0	0	10/13
03	**620**	-	-	500	120	320	29	16	19	16	12/15
Juniperus osteosperma											
85	**0**	-	-	-	-	-	0	0	0	0	-/-
91	**0**	-	-	-	-	-	0	0	0	0	-/-
98	**0**	-	-	-	-	60	0	0	0	0	-/-
03	**40**	-	-	-	40	60	0	0	100	0	-/-
Kochia prostrata											
85	**0**	-	-	-	-	-	0	0	-	0	-/-
91	**0**	-	-	-	-	-	0	0	-	0	-/-
98	**0**	-	-	-	-	-	0	0	-	0	-/-
03	**40**	-	-	40	-	-	50	0	-	0	18/29
Opuntia spp.											
85	**200**	-	-	200	-	-	0	0	-	0	6/10
91	**333**	-	133	200	-	-	0	0	-	0	6/13
98	**0**	-	-	-	-	-	0	0	-	0	-/-
03	**0**	-	-	-	-	-	0	0	-	0	6/14

		Age class distribution (plants per acre)					Utilization				
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% poor vigor	Average Height Crown (in)
Sambucus cerulea											
85	**0**	-	-	-	-	-	0	0	-	0	-/-
91	**0**	-	-	-	-	-	0	0	-	0	-/-
98	**0**	-	-	-	-	-	0	0	-	0	-/-
03	**20**	-	-	20	-	-	0	0	-	0	48/43